

WHAT IS CLAIMED IS:

1. An image printing apparatus comprising:
clock generating means for generating a dot clock as
a basis of each pixel forming an image;
5 image printing means for printing a one-line image in
a main scanning direction in accordance with image data
with reference to the dot clock output from said clock
generating means, and printing a one-page image by
repeating in the sub-scanning direction one-line image
10 printing performed in the main scanning direction; and
a clock control section which changeably controls a
frequency of the dot clock during scanning of one line in
the main scanning direction.
2. An apparatus according to claim 1, wherein said
15 clock control section controls even the number of pixels of
one line in the main scanning direction in a case in which
the frequency of the dot clock is changed during scanning
of one line to be equal to that in a case in which the
frequency is not changed.
- 20 3. An apparatus according to any one of claims 1 and
2, wherein said clock control section changes the frequency
of the dot clock during scanning of one line in the main
scanning direction on the basis of a plurality of partial
main-scanning offsets in a test image printed by said image
25 printing apparatus in accordance with test image data.
4. An apparatus according to any one of claims 1 and
2, wherein
said apparatus further comprises offset setting means

for setting at least two offsets between distances between test patterns in test images printed by said image printing apparatus in accordance with test image data having test patterns arranged at at least three positions in the main scanning direction and reference distances between comparative test patterns, and

5 said clock control section changes the frequency of the dot clock during scanning of one line in the main scanning direction on the basis of the respective offsets set by said offset setting means.

10 5. An apparatus according to claim 4, wherein said clock control section changes the frequency of the dot clock to evenly distribute the offsets to the respective pixels between the test patterns so as to eliminate the offsets.

6. An apparatus according to any one of claims 4 and 5, wherein

20 said apparatus comprises test pattern interval detecting means for computing distances between the test patterns in the test images by detecting positions of the test patterns, and

offset computing means for computing offsets between the distances between the test patterns which are computed by said test pattern interval detecting means and the reference distances between the comparative test patterns, and

25 at least two offsets computed by said offset computing means are set by said offset setting means.

7. An apparatus according to any one of claims 4 to 6, wherein the reference distances are distances between the test patterns in the test image data.

8. An apparatus according to any one of claims 4 to 5 6, wherein said image printing apparatus prints images on two surfaces of an image recording sheet, and said clock control section changes the frequency of the dot clock when an image is printed on one surface of the image recording sheet or images are printed on the two surfaces.

10 9. An apparatus according to claim 8, wherein the reference distances are distances between the test patterns in the test image data or distances between test patterns in test image data printed on a reverse surface of an image recording sheet when the frequency of the dot clock is 15 changed in printing an image on an obverse surface of the image recording sheet, or the reference distances are distances between the test patterns in the test image data or distances between test patterns in test image data printed on the obverse surface of the image recording sheet 20 when the frequency of the dot clock is changed in printing an image on the reverse surface of the image recording sheet.

10. An apparatus according to any one of claims 4 to 9, wherein said image printing apparatus prints an image by 25 superimposing an image formed in a first color and an image formed in a second color different from the first color, and said clock control section changes the frequency of the dot clock when one or both of images in the first and

second colors are to be printed.

11. An apparatus according to claim 10, wherein the reference distances are distances between the test patterns in the test image data or distances between test patterns in test image data printed in the second color when the frequency of the dot clock is changed in printing an image in the first color, or the reference distances are distances between the test patterns in the test image data or distances between test patterns in test image data printed in the first color when the frequency of the dot clock is changed in printing an image in the second color.

12. An apparatus according to any one of claims 1 to 11, wherein

said clock generating section comprises a fundamental clock generating section which generates a fundamental clock having a predetermined frequency, and

a frequency changing section which can change the frequency of the fundamental clock generated by said fundamental clock generating section, and

said clock control section changes a frequency of a fundamental clock output from said frequency changing section during scanning of one line in the main scanning direction.

13. An apparatus according to claim 12, wherein said frequency changing section has a delay line which generates delay clocks by digitally delaying the fundamental clock, and

said clock control section changes the frequency of

the dot clock during scanning of one line in the main scanning direction by selecting a predetermined delay clock from the delay line.

14. A main-scanning offset adjusting method for an
5 image printing apparatus, which adjusts a main-scanning offset in the image printing apparatus which generates a dot clock as a basis of each pixel forming an image, prints a one-line image in a main scanning direction in accordance with image data with reference to the dot clock, and prints
10 a one-page image by repeating in a sub-scanning direction one-line printing performed in the main scanning direction, comprising the steps of:

printing test images in accordance with test image data having test patterns arranged at at least three
15 positions in the main scanning direction;

obtaining at least two offsets between distances between the test patterns in the test images and reference distances between comparative test patterns; and

setting the respective offsets such that the
20 frequency of the dot clock can be changed during scanning of one line in the main scanning direction on the basis of the respective offsets.

15. A main-scanning offset correcting method for an
image printing apparatus, which corrects a main-scanning
25 offset in the image printing apparatus which generates a dot clock as a basis of each pixel forming an image, prints a one-line image in a main scanning direction in accordance with image data with reference to the dot clock, and prints

a one-page image by repeating in a sub-scanning direction one-line printing performed in the main scanning direction, comprising the steps of:

- 5 setting at least two offsets, before image printing, between distances between test patterns in test images printed in accordance with test image data having test patterns arranged at at least three positions in the main scanning direction and reference distances between comparative test patterns; and
- 10 changing the frequency of the dot clock during scanning of one line in the main scanning direction on the basis of the respective offsets set in the offset setting step during image printing.

- 15 16. An image printing apparatus including clock generating means for generating a dot clock as a basis of each pixel forming an image, and image printing means for printing a one-line image in a main scanning direction in accordance with image data with reference to the dot clock output from said clock generating means, and printing a
- 20 one-page image by repeating in the sub-scanning direction one-line image printing performed in the main scanning direction, comprising

- 25 control means for controlling image printing in the main scanning direction such that distances between test patterns in reference images which are arranged at at least three positions in the main scanning direction coincide with distances between test images printed in accordance with test image data corresponding to the reference images.

17. An apparatus according to claim 16, wherein said control means comprises a clock control section which changeably controls the frequency of the dot clock during scanning of one line.

5 18. An image printing apparatus for printing images on two surfaces of an image recording sheet, which includes clock generating means for generating a dot clock as a basis of each pixel forming an image, and image printing means for printing a one-line image in a main scanning
10 direction in accordance with image data with reference to the dot clock output from said clock generating means, and printing a one-page image by repeating in the sub-scanning direction one-line image printing performed in the main scanning direction,

15 wherein the frequency of the dot clock can be set to different frequencies depending on whether an image is to be printed on an obverse surface or reverse surface of an image recording sheet.

19. An image printing apparatus including clock
20 generating means for generating a dot clock as a basis of each pixel forming an image, toner image forming means which includes a writing section which forms a one-line image in a main scanning direction in accordance with image data with reference to the dot clock output from said clock
25 generating means, and forms a one-page image by repeating in the sub-scanning direction one-line image printing performed in the main scanning direction, said toner image forming means forming a toner image on one surface of an

image recording sheet, and fixing means for fixing the toner image formed by said toner image forming means on the image recording sheet, and prints images on two surfaces of the image recording sheet by causing said toner image
5 forming means to form a toner image on a reverse surface of the image recording sheet having the toner image formed on one surface and causing said fixing means to fix the image,

wherein the frequency of the dot clock can be set to different frequencies depending on whether an image is to
10 be printed on an obverse surface or reverse surface of an image recording sheet.

20. An apparatus according to claim 19, wherein the frequency of the dot clock can be set to a given frequency when an image is to be printed on at least one of obverse
15 and reverse surfaces of an image recording sheet.